

N. B. : (1) Question No. 1 is **compulsory**.
(2) Attempt any **three** from remaining.

1. (a) Write a recursive method to calculate factorial of a integer number. 5
(b) Explain Bit-wise operators available in JAVA with example. 5
(c) Explain how JAVA is platform - independent. 5
(d) Write a program to find the largest of the three integers accepted from command line. 5
2. (a) Write a detailed note on System.arraycopy(). 5
(b) Write a program to display following pattern :- 5

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1
0 1
1 0 1
0 1 0 1

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(c) Explain different types of inheritance with example. 10
3. (a) With proper example explain the steps to create a package and add a class or interface. 5
(b) Explain Thread life cycle. 5
(c) Write a program in JAVA to accept the values of a, b, c and d. 10
Calculate and display $((a*d) + (b*c)) / (b*d)$.
Create user defined exception to display proper message when value of $(b*d)$ is ZERO.
4. (a) What is Vector ? Explain any five methods of Vector. 5
(b) Explain what are abstract class and abstract methods. 5
(c) Write a program to find largest and second largest element of an array. 10
5. (a) Explain method overloading and method overriding with suitable example. 10
(b) Write a program to accept a number from command line and to check whether it is Armstrong Number or Not. 10
6. Write short notes on (any four) :- 20
 - (a) Wrapper classes.
 - (b) Life cycle of Applet
 - (c) Static members
 - (d) Thread synchronization
 - (e) Exception handling mechanism.